

ABSTRACT

This invention provides new, highly conductive materials comprising crystallized electron pairs within an insulating matrix. Crystallized electron pairs can combine with each other to form quasi-one-dimensional structures, quantum nanowires, that have
5 nanoscale diameters and microscale lengths or longer. Quantum nanowires can also be formed as closed loops. Quantum nanowires comprising crystallized electron pairs exhibit very high electrical conductivity over a range of temperatures from 0 Kelvins up to the decomposition temperature of the materials. The quantum nanowires of this invention can be used in a variety of electronic, opto-electronic, electro-optical, motive, sensing and
10 other ways to provide nanoscale structures for manufacturing small devices having low power requirements, low energy dissipation and very rapid responses.

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